CLAIMS

WHAT IS CLAIMED IS:

1. An apparatus to control a stepper motor, comprising:

a torque calculator to calculate torque applied to the stepper motor and to output a driving current setting signal corresponding to the calculated torque;

a controller to output a control signal to apply variable driving current which is based on the driving current setting signal, to the stepper motor; and

a driver to drive the stepper motor based on the control signal inputted from the controller.

2. The apparatus according to claim 1, further comprising:

a current detector to detect driving current flowing into the stepper motor and to output the detected driving current to the torque calculator.

3. The apparatus according to claim 2, wherein the torque calculator comprises:

an A/D converter to convert the inputted driving current into digital signals;

a CPU (Central Processing Unit) to calculate the torque using information on the A/D converted driving current and to read driving current setting information corresponding to the calculated torque information; and

a D/A converter to convert the read driving current setting information into

analog signals.

4. The apparatus according to claim 3, further comprising:

a storage unit to store the driving current setting information corresponding to the calculated torque information therein.

5. The apparatus according to claim 4, wherein the storage unit stores the calculated torque information and the corresponding driving current setting information therein, causing the torque to be proportional to the driving current.

6. The apparatus according to claim 1, wherein the variable driving current varies according to a variation of the driving current setting signal inputted to the controller.

7. The apparatus according to claim 6, wherein the driver applies the variable driving current to the stepper motor according to the control signal inputted from the controller to drive the stepper motor.

8. The apparatus according to claim 2, wherein the torque calculator converts the detected driving current inputted from the current detector to calculate the torque applied to the stepper motor.

9. The apparatus according to claim 3, wherein the CPU calculates a magnitude of the torque applied to the stepper motor using information on an amount of current in each excited phase of the stepper motor.

10. The apparatus according to claim 9, wherein the magnitude of the torque applied to the stepper motor is proportional to the driving current setting signal.

11. The apparatus according to claim 1, wherein the variable driving current is proportional to a magnitude of the torque applied to the stepper motor, so that a torque margin is maintained in a constant state.

12. A method of controlling a stepper motor, comprising:

outputting a signal corresponding to torque applied to the stepper motor;

outputting a driving control signal to apply variable driving current to the stepper motor based on a driving current setting signal; and

driving the stepper motor based on the driving control signal.

13. The method according to claim 12, wherein the outputting the signal corresponding to the torque applied to the stepper motor comprises:

detecting driving current flowing in each excited phase of the stepper motor;

A/D converting the driving current detected in each excited phase;

calculating the torque based on information on the driving current;

reading driving current setting information corresponding to the calculated torque information; and

D/A converting the driving current setting information and outputting the D/A converted information.

14. The method according to claim 12, wherein the driving current setting signal causes the driving current to be applied to the stepper motor in proportion to the torque applied to the stepper motor.

15. A method of controlling a stepper motor, comprising:

calculating torque applied to the stepper motor and outputting a driving current setting signal corresponding to the calculated torque;

outputting a control signal to apply variable driving current which is based on the driving current setting signal, to the stepper motor; and

driving the stepper motor based on the control signal inputted from the controller.